

WHAT IS CLAIMED IS:

- 1. A substrate structure with built-in via hole resistors, comprising:
a core layer, made of an insulating material; and
a plurality of via holes, penetrating the core layer and to be filled with polymer
thick film resistor, and a solder ball or a conductive pad being formed on
both ends of the via hole to provide electrical conductivity.**
- 2. The substrate structure as claimed in Claim 1, wherein the core layer is a
preprag.**
- 3. The substrate structure as claimed in Claim 2, wherein the core layer further
comprises a copper foil on top of the film layer.**
- 4. The substrate structure as claimed in Claim 1, wherein the solder ball is made of
tin, or tin alloy.**
- 5. The substrate structure as claimed in Claim 1, wherein the conductive pad is
made of metal or metal alloy or a conductive paste.**
- 6. The substrate structure as claimed in Claim 1, wherein the resistance of the via
hole resistor is adjusted by varying the diameter-length ratio of the via hole,
which, in turn, varying the amount of the PTFR filled.**
- 7. The substrate structure as claimed in Claim 1, wherein the via holes is filled with
one or more via hole PTFR to reduce the parasitical inductance generated by
PTFR with a large diameter-length ratio.**
- 8. The substrate structure as claimed in Claim 7, wherein the equivalent circuit of
the reducing parasitical inductance has the effect of distributed components that
is used in a high frequency system to adjust the capacitance and inductance.**

- 9.** A method for manufacturing a substrate with built-in via hole resistors, the method comprising the following steps:
- (a)** providing a substrate with metal foils on both sides;
 - (b)** performing exposure, print and etching to the metal foil on the top side of the substrate to form the locations on the substrate where the via holes will be drilled;
 - (c)** laminating a copper foil and a film on the top side of the substrate;
 - (d)** drilling via holes on the copper foil and the film with laser;
 - (e)** filling PTFR into the via holes;
 - (f)** manufacturing a conductive path; and
 - (g)** repeating steps (c), (d), and (f), to manufacture the next layer of the board.
- 10.** The method as claimed in Claim 9, wherein step (e) is a roller printing step.
- 11.** The method as claimed in Claim 9, wherein step (e) is a screen printing step.
- 12.** The method as claimed in Claim 9, wherein step (e) is a stencil printing step.
- 13.** The method as claimed in Claim 9, wherein step (e) is a dispenser printing step.
- 14.** The method as claimed in Claim 9, wherein step (e) is a ink-jet printing step.
- 15.** The method as claimed in Claim 9, wherein a step of filling PTFR between two neighboring pads is after step (b).